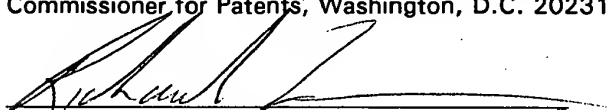


SOLE INVENTOR

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RICHARD ZIMMERMANN

**APPLICATION FOR
UNITED STATES LETTERS PATENT**

S P E C I F I C A T I O N

TO ALL WHOM IT MAY CONCERN:

Be it known that I, Tom Lee Sorensen, a citizen of the United States, residing at 1228 Bards Avenue, Naperville, 60564, in the County of Du Page and State of Illinois have invented a new and useful APPARATUS AND METHOD FOR DOWNLOADING AND STORING DATA FROM A DIGITAL RECEIVER, of which the following is a specification.

APPARATUS AND METHOD FOR DOWNLOADING AND STORING DATA FROM A DIGITAL RECEIVER

Technical Field of the Invention

5 The present invention relates to an apparatus that enables a user to download data from a digital receiver and to store the downloaded data.

Background of the Invention and Prior Art

10 The ATSC digital broadcast standard for digital television allows for the transmission of 19 Mbits/sec in an RF channel having a 6 MHZ bandwidth. Although this allocated bandwidth is adequate for a single analog NTSC television channel, the ATSC bit rate permits the same channel to support the concurrent transmission of several standard definition television (SDTV) programs (i.e., 15 programs displayable with a resolution comparable to that of the NTSC analog program). Alternatively, the allocated bandwidth at the ATSC bit rate permits a channel to support the transmission of a single high definition television (HDTV) program at a time. Moreover, the ATSC digital 20 broadcast standard permits data to be transmitted in the channel along with digital programming. Therefore, data

packets may be multiplexed in the channel with video and audio program packets.

5 Various receivers, such as digital televisions, digital VCRs, and computers equipped with digital television tuner and demodulator cards, may receive the digital programming. Because data may be transmitted along with one or more programs in a digital RF channel, it is possible to transmit program content that includes data. Such program content, for example, may be a commercial with an embedded uniform resource locator (URL) associated with a website containing additional information about the product or service being advertised or may include a coupon for the advertised product.

15 Because the program content that includes the Internet address is broadcast in a digital RF channel, it is also receivable by digital receivers other than computers, such as digital televisions. However, typical digital televisions are not web enabled. Therefore, the user of such a digital television has no access to the additional information linked to the Internet address embedded in a received program if the user does not also have a computer with a tuner and demodulator card.

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The present invention is directed to a device and method which permit remote access to data, such as an Internet address, embedded in a program received by a digital receiver.

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Summary of the Invention

In accordance with one aspect of the present invention, a data retrieval system for retrieving data from a digital broadcast signal is provided. The digital broadcast signal includes at least one television programming packet and at least one data packet that contains the data. The data retrieval system comprises a digital receiver adapted to receive the digital broadcast signal and adapted to separate the data from the digital broadcast signal and further comprises a portable data storage device in communication with the digital receiver and adapted to receive the data from the digital receiver and further adapted to store the data.

In accordance with another aspect of the present invention, a personal digital assistant has an input device, an output device, a memory, and a controller. The controller is arranged to read data at the input device which is acquired from a digital receiver that receives the

data in a digital broadcast signal. The controller is further arranged to cause the data to be stored in the memory and to cause the data to be transferred from the memory to the output device.

In accordance with yet another aspect of the present invention, a method of retrieving data transmitted in a digital broadcast signal comprises the steps of a) acquiring the data from a digital receiver that receives the digital broadcast signal; b) storing the data in a memory that is separate from the digital receiver; and c) transferring the data from the memory to a computer that is separate from the digital receiver.

Brief Description of the Drawings

The features and advantages of the present invention will become more apparent from a detailed consideration of the invention when taken in conjunction with the drawings in which:

Figure 1 illustrates a data retrieval system including a digital receiver and a personal digital assistant according to one embodiment of the present invention; and

Figure 2 illustrates the personal digital assistant linked to a personal computer according to another embodiment of the present invention.

Description of the Preferred Embodiment

As shown in Figure 1, a data retrieval system 10 includes a digital receiver 12, and a personal digital assistant (PDA) 14. The digital receiver 12 is assumed to be a digital television. However, as noted below, the digital receiver 12 may be other types of digital equipment. Assuming that the digital receiver 12 is a digital television, the digital receiver 12 includes a tuner 16 for tuning to one of a plurality of RF channels. The output of the tuner 16 is demodulated by a digital VSB demodulator 18 in order to recover the baseband digital signal which includes digital television (DTV) programming packets multiplexed with data packets. The portion of the baseband digital signal comprising the DTV programming packets is supplied by the digital VSB demodulator 18 to a set of video/audio processors 20 such that the video portion of the baseband digital signal is suitably decoded, processed, and supplied to a display screen [not shown], and such that the audio portion of the baseband digital signal is suitably

decoded, processed, and supplied to speakers [not shown]. The tuner 16, the digital VSB demodulator 18, and the video/audio processors 20 are controlled by a television controller 22 as is conventional. The digital VSB demodulator 18, as controlled by the television controller 22, supplies the portion of the digital baseband signal comprising the data packets to a memory 24 for storage.

The data packets transmitted in the digital VSB signal and stored in the memory 24 may or may not be related to the DTV programming transmitted via the DTV programming packets and being displayed by the digital television 12. For example, in one embodiment, the DTV programming includes a television commercial for advertising a product [not shown] and the data packets transmitted therewith include Internet data containing, for example, a URL for a website sponsored by the manufacturer of the product. In another embodiment, the data transmitted with the television commercial includes data for generating a coupon for the product advertised in the commercial. Preferably, but not necessarily, the television commercial prompts the user to download the data for the purpose of retrieving the website URL, or, alternatively, to download the data for the purpose of generating the coupon contained therein.

To enable access to the stored data, the digital television 12 includes an IR transceiver 26 that communicates with an IR transceiver 28 disposed in the PDA 14. The PDA 14 further includes an input device, such as a button pad 30 which includes a set of buttons used to enter, for example, a download command. The download command is thereafter routed to a processor 32 also residing within the PDA 14. In response to the download command, the processor 32 causes the IR transceiver 28 to transmit a download command signal to the transceiver 26 in the digital television 12. The television controller 22 residing within the digital television 12 responds to the download command signal received by the transceiver 26 by causing the data stored in the memory 24 to be transmitted in a data signal by the transceiver 26 to the transceiver 28 of the PDA 14.

When the data signal is received at the PDA 14, the processor 32 of the PDA 14 causes the transceiver 28 to transfer the data in the data signal to a memory 34 coupled to the transceiver 28. Preferably, after the data signal has been received by the transceiver 28 and the data transmitted therein has been stored in the memory 34, the processor 32 causes a sound generating circuit 36 to generate a tone or beep that alerts the user that the data

has been successfully retrieved from the digital television 12. Alternatively, the PDA 14 may generate any other notification signal to alert the user that the data has been stored, including, for example, causing a light emitting diode (LED) [not shown] to flash, to remain lit or to change from a flashing state indicating that the data transfer is taking place to a steady on state indicating that data transfer is complete.

A prompt may be included in the program content and may be displayed by the digital receiver 12 either visually or audibly to the user in order to notify the user that internet content is available for retrieval by the PDA 14. When the prompt is present, the user operates the button pad 30 as described above in order to retrieve the internet content if data retrieval is desired. Alternatively, no prompt need be given so that the user operates the PDA 14 on the chance that Internet may be available for retrieval. In this case, the notification signal provided by the PDA 14 indicates to the user whether the Internet content has been retrieved. As a further alternative, when internet content is detected by the television controller 22 and stored in the memory 24, the television controller 22 may be arranged to provide a prompt

to the user. Such a prompt may be an on-screen prompt, an audible prompt, or a signal transmitted by the transceiver 26 to the PDA 14 in order to initiate a local prompt by the PDA 14.

Referring also to Figure 2, to enable the transfer of the data stored in the memory 34 to a micro-processor based device, such as, for example, a personal computer 40, the PDA 14 further includes a data port 38 by which the data is transferred to a data port 42 associated with the personal computer 40. The data ports 38 and 42 may both be serial data ports, such as RS-232 data ports, that are interconnected by a cable 44. Alternatively, the data ports 38 and 42 may instead be wireless transceivers capable of infra-red, radio frequency, or ultrasonic signal transmission/reception and/or the like.

In an embodiment in which the data includes Internet data containing a URL website address, the personal computer 40 preferably includes a software program [not shown] that enables web-browsing and may further be programmed such that the supply of the data stored in the PDA 14 to the data port 42 causes the personal computer 40 to launch the web-browsing software program and further

causes the personal computer to seek the URL website address provided at the data port 42.

In a further embodiment, additional data codes that designate the URL website address as having been downloaded from a digital VSB broadcast signal and/or that identify the user could also be included with the website URL data. By reading these additional codes, the website provider could determine which users accessing the website have actually viewed the television commercial. Thus, the present invention offers advertisers a mechanism for indicating the viewership and possibly the success of a given television commercial. Additionally, these codes could be used to enable the user to download a coupon from the website that would not otherwise be accessible.

If the data stored in the PDA 14 contains coupon generating data instead of Internet data, then the data, upon being transferred to the personal computer 40, may be used by the personal computer 40 to print the coupon [not shown]. Alternatively, the coupon provided in the data signal may be an electronic coupon that is redeemable by bringing the PDA 14 to a retailer having the capability to download the data from the PDA 14. The coupon information could also be down-loaded to a device that stores the data

on a smart card [not shown] that is scanned for redemption by a retailer. In a still further embodiment, instead of generating a coupon, the data downloaded from the PDA 14 may be used by the personal computer 40 to generate an advertisement that lists, for example, retailers that carry the advertised product, the location of such retailers and sale information for the advertised product.

The data transmitted via the digital VSB broadcast signal may include a variety of information that may be of varying degrees of interest to the user. For example, the data may include both an electronic coupon and a website URL. However, the user may only be interested in obtaining the electronic coupon. To enable download of the electronic coupon exclusively, the processor 32 of the PDA 14 is programmed to be able to analyze the data received by the transceiver 28 for the purpose of identifying the desired portions of the data for subsequent storage in the memory 34. Moreover, the keypad 30 of the PDA 14 preferably includes buttons that enable the user to specify which portions of the data signal are desired. Alternatively, the processor 32 may simply be programmed to store all of the received data in the memory 34 and in response to a user-entered command the processor 32 may cause all of the data

to be transmitted to the personal computer 40 which may be programmed to be able to identify the data selected by the user. For example, upon linking the PDA 14 to the personal computer 40 with the cable 44, the personal computer 40 may be programmed to launch a data guide program [not shown] that causes a listing of the various data sets stored in the PDA memory 34 to be displayed. Or, the television controller 22 (see Figure 1) may be programmed to be able to analyze the data transmitted in the digital VSB broadcast signal and may further be programmed to respond to a request from the PDA 14 for a specific set of data by transmitting only the specific set of requested data to the PDA 14.

The PDA 14, in addition to having the data transfer and storage capabilities described herein may further include features that enable, for example, the organization and storage of a daily calendar, and/or the storage and retrieval of data such as telephone numbers and/or addresses. The PDA 14 may additionally include other features such as, for example, telephone signal reception/processing in order to facilitate retrieval of telephone messages and/or to notify the user of an incoming telephone call, as is performed by a conventional telephone paging system. Of course, the PDA 14 could additionally

include a display and other conventional componentry necessary to support these features.

Certain modifications of the present invention have been discussed above. Other modifications will occur to those practicing in the art of the present invention. For example, according to the description above, the IR transceivers 26 and 28 enable communication between the digital television 12 and the PDA 14. However, the IR transceivers 26 and 28 may instead be any other type of wireless link such as an RF or ultrasonic link. Alternatively, the IR transceiver 26 and 28 may instead be replaced with a set of serial data ports that are coupled by a data transmission cable.

Also, it is suggested above that the digital receiver 12 may be a tunable receiver such as a digital television. Alternatively, the digital receiver 12 may be any receiver capable of receiving digital data. For example, the digital receiver 12 may be a radio, a VCR, or a game.

Moreover, as described above, data is stored in the memory 24 for instantaneous or later retrieval by the PDA 14. Instead, however, the data need not be stored in the memory 24, in which case the PDA 14 must retrieve the

data from the digital receiver 12 when it is received by the digital receiver 12 or not at all.

Still further, the present invention has been described above at least in part in relation to downloading data transmitted in a digital vestigial sideband (VSB) broadcast signal. However, it should be noted that the present invention also is applicable to downloading data transmitted in other types of digital broadcast signals such as COFDM signals, QAM signals, QPSK signals, and/or the like.

Accordingly, the description of the present invention is to be construed as illustrative only and is for the purpose of teaching those skilled in the art the best mode of carrying out the invention. The details may be varied substantially without departing from the spirit of the invention, and the exclusive use of all modifications which are within the scope of the appended claims is reserved.